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EXAMINER	
TAI, XIUYU	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,087	TAO ET AL.	
	Examiner	**Art Unit**	
	Xiuyu Tai	1759	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8,10,11,22-26,28-30 and 32-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,10,11,22-26,28-30 and 32-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/15/2010 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-6, 8, 10-11, 22-26, 28-30, 32-33 have been considered but are moot in view of the new ground(s) of rejection necessitated by applicant's amendments.

3. In response to the argument that Bright teaches away from including a high voltage generator (see page 10 of REMARKS), the high voltage generator that the reference regards is for the power supply for depositing the charged particles on target (col. 3, line 22-25), nor for charging particles. Therefore, the teaching of Bright does not conflict with provision of an electric field for charging particles.

Response to Amendment

4. The amendment filed 3/15/2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The instant specification

describes that the outer surface of rotor remains non-permeable or continuous and Figure 4a and 4b illustrates the outer surface of rotor 18 with outwardly projecting portions (see page 9, Figures 4a-4b). However, the newly submitted claim 34 recites the limitation of “the outer surface of the rotor is smooth”. The original disclosure does not support such amendment

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 34 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The instant specification describes that the outer surface of rotor remains non-permeable or continuous and Figure 4a and 4b illustrates the outer surface of rotor 18 with outwardly projecting surfaces (see page 9, Figures 4a-4b). However, the newly submitted claim 34 recites the limitation of “the outer surface of the rotor is smooth”. For the purpose of examination, claim 34 will be interpreted as “the outer surface of the rotor is continuous" in light of the instant specification.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-4, 8, 10, 20, 23, 26, 28, and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bright et al (U.S. 4, 072, 129) in view of Fotland et al (PG-PUB US 2002/0085977).

11. Regarding claim 1, Bright et al disclose an apparatus for electrostatic powder deposition having a tribo electrification device for charging particles (col. 1, line 5-7). The device includes:

(1) a housing 40 (i.e. a chamber, Figure 1, col. 1, line 40-45 & col. 3, line 21-22) having an hopper 10 for feeding powder (i.e. an inlet) at one end of the housing 40 (Figure 1, col. 2, line 39-40) and an outlet 14 for discharging the powder at the other end of the housing 40 (Figure 1, col. 2, line 18-20); and

(2) a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) in the housing 40, wherein the powder acquires a charge by a tribo electric mechanism via the blades of the fan rotor 34 (col. 2, line 43-49) and rotor 34 may be coated with material such as nylon (i.e. a non permeable outer surface, col. 3, line 1-3).

Bright does not teach an electric filed in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency by increasing charge-to-mass ratios (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an electric field between two electrodes can effectively charge particles (Figure 5, paragraph [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an electric field of an ion generating source as suggested by Fotland in order to improve charging efficiency of Bright.

The device for intended use in charging particles is a recitation for intended use. A recitation with respect to the manner in which a claimed apparatus is intended to employed does not differentiate the claimed apparatus from a prior art if the prior art teaches all the structural limitations of the claim (see MPEP 2114).

12. Regarding claim 2, the fan rotor of Bright 34 has a member of blades (Figure 1, col. 1, line 41 & col. 2, line 47), resulting in a non-circular cross section.

13. Regarding claim 3, the rotor fan 34 of Bright is positioned within the housing 40 and the fluidized powder falls on to the fan rotor 34 (Figure 1, col. 2, line 39-40).

14. Regarding claim 4, depending upon the orientation, the inlet of the housing is on one end of the housing while the outlet is on the other side of the housing (Figure 1).

15. Regarding claim 8, Bright teaches a typical speed for epoxy resin is about 3000 to 4000 rpm (col. 3, line 15-16), which is within the claimed range of rotating speed. Moreover, the rotating speed is considered as an operating parameter of the device and manner operating the device does not differentiate apparatus claim (MPEP 2114).

16. Regarding claim 10, Fotland teaches that the electric field of corona discharge is created from a voltage source 9/11 by connecting a first lead to the first electrode 39 co-axially positioned within the housing 37 and a second lead to the second electrode 25 on the wall of the housing 37 (Figures 1 & 5, paragraphs [0015], [0022] & [0026]) and particles passing through the charging device are effectively charged (paragraph [0035]), but Bright/Fotland does not explicitly teach to connect the first lead to the rotor. However, since the rotor 34 is co-axially positioned within the housing 40 of Bright (Figure1), one having ordinary skill in the art would immediately have envisioned to

connect the first lead to the rotor in order to generate the electric field between the concentric rotor 34 and the housing 40 for improving charging efficiency of Bright.

17. Regarding claim 34, the outer surface of the rotor 34 Of Bright has a continuous surface (Figure 1).

18. Regarding claim 35, the rotor 34 of Bright comprises a cylinder (Figure 1).

19. Regarding claim 36, the rotor 34 of Bright rotates in a horizontal axis (Figure 1).

20. Regarding claim 37, the rotor 34 of Bright includes blades for providing more surfaces for tribo-charging (col. 2, line 45-50). However, it has been held that omission of an element and its function is obvious if the function of the element is not desired (see MPEP 2144). Therefore, omission of the blades from the rotor 34 of Bright is within ordinary skill in the art if a large surface is not desired.

21. Regarding claim 22, Bright et al disclose an apparatus for electrostatic deposition having a tribo electrification device for charging particles (col. 1, line 5-7). The device includes:

(1) a housing 40 having walls (i.e. a chamber having a wall, Figure 1, col. 1, line 40-45 & col. 3, line 21-22) having an hopper 10 for feeding powder (i.e. an inlet) at one end of the housing 40 (Figure 1, col. 2, line 39-40) and an outlet 14 for discharging the powder at the other end of the housing 40 (Figure 1, col. 2, line 18-20);

(2) a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) within the housing 40, wherein the powder acquires a charge by a tribo electric mechanism via the blades of the fan rotor 34 (col. 2, line 43-49).

The claim contains means plus function language. Rotatable means for frictionally charging the particles is defined as a rotor in the instant specification. The charging fan rotor 34 is an equivalent structure to a rotor. Therefore, the charging fan rotor 34 of Bright reads on “rotatable means for frictionally charging the particles”.

Moreover, means for forming an electric field is defined as an external voltage source for charging the particles in the instant specification.

Bright does not teach an external voltage source in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an external voltage source 9/11 can effectively charge particles (Figures 1 &5, paragraphs [0015], [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an external voltage source of an ion generating source as suggested by Fotland in order to improve charging efficiency of Bright.

The device for intended use in charging particles is a recitation for intended use. A recitation with respect to the manner in which a claimed apparatus is intended to employed does not differentiate the claimed apparatus from a prior art if the prior art teaches all the structural limitations of the claim (see MPEP 2114). Moreover, Bright sates that the device is intended for using in charging powder (col. 2, line 17-19), which may contain a particle mixture.

22. Regarding claim 23, the charging fan rotor 34 of Bright is positioned within the housing 40 (Figure 1, col. 1, line 40-45 & col. 3, line 21-22) and rotor 34 may be coated with material such as nylon (col. 3, line 1-3).

23. Regarding claim 26, an electric motor 36 powers the fan rotor 34 (Figure 1, col. 2, line 39-40).

24. Regarding claim 28, Fotland teaches that the electric field of corona discharge is created from a voltage source 9/11 by connecting a first lead to the first electrode 39 co-axially positioned within the housing 37 and a second lead to the second electrode 25 on the wall of the housing 37 (Figures 1 & 5, paragraphs [0015], [0022] & [0026]) and particles passing through the charging device are effectively charged (paragraph [0035]), but Bright/Fotlad does not explicitly teach to connect the first lead to the rotor. However, since the rotor 34 is co-axially positioned within the housing 40 of Bright (Figure 1), one having ordinary skill in the art would immediately have envisioned to connect the first lead to the rotor in order to generate the electric field between the concentric rotor 34 and the housing 40 fro improving charging efficiency of Bright.

25. Claims 5,6, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bright et al (U.S. 4, 072, 129) and Fotland et al (PG-PUB US 2002/0085977) as applied to claims 1 and 22 above, and further in view of Stencel et al (U.S. 6,498,313).

26. Regarding claims 5 and 24, Bright/Fotland fails to teach a partition projecting into the chamber. However, Stencel et al disclose an electrostatic separation apparatus. The apparatus comprises a partition 50 with an insert 62 as a flow divider for promoting

contacts between particle-to-particle/particle-to wall in order to recharge particles (Figure 4 & 5, col. 10, line 28-34). Therefore, it would be obvious for one having ordinary skill in the art to include a partition/insert as suggested by Stencel in the chamber of Bright/Fotland in order to enhance charging efficiency. The partition/insert of Bright/Fotland/Stencel is fully capable of performing the claimed functions.

27. Regarding claims 6 and 25, Stencel teaches that the insert 62 may be positioned between the inlet and outlet (col. 10, line 28-30). One having ordinary skill in the art would have realized to adjust the position of the insert 62 in order to improve charging efficiency. Furthermore, it has been held that provision of adjustability, where needed, involves only routine skill in the art (see MPEP 2144).

28. Claims 11, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Bright et al (U.S. 4, 072, 129) and Fotland et al (PG-PUB US 2002/0085977)as applied to claims 1 and 22 above, and further in view of Stencel et al (U.S. 5,755,333, cited in IDS).

29. Regarding claims 11 and 29, Bright teaches a powder hopper 10 for feeding uncharged powder to the fan 12 (i.e. a feedstream to the inlet, Figure 1, col. 2, line 17-19), but Bright/Fotland does not teach an electrostatic separator downstream of the charger for separating charged particles. However, Stencel et al disclose an apparatus for triboelectric-centrifugal separation (ABSTRACT). The apparatus includes a triboelectric charging section 12 having a an inlet 28 and an outlet 30 (Figure 1, col. 4, line 1, line 39 & line 54) and a separation section 14 that receives charged feedstock from the outlet 30 (Figure 1, col. 4, line 55-56) for electrostatically separating particles

(col. 5, line 12-17). Therefore, it would be obvious for one having ordinary skill in the art to include a separation section as suggested by Stencel in order to separate charged particles with the device of Bright/Fotland if separation is desired.

30. Claims 1-4, 8, 10-11, 22, 23, 26, 28-30, and 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stencel et al (U.S. 5,755,333, cited in IDS) in view of Bright et al (U.S. 4, 072, 129), and further in view of Fotland et al (PG-PUB US 2002/0085977).

31. Regarding claim 1, Stencel et al disclose an apparatus for triboelectric-centrifugal separation (ABSTRACT). The apparatus is used for separating charged particles from a raw feedstock including two species of particle (Figure 1; col. 4, line 35-37). The apparatus includes: a triboelectric charging section 12 having an annular path 18 (i.e. a chamber, Figure 1, col. 4, line 1-3) with an inlet 28 (Figure 1, col. 4, line 35-38) and an outlet 30 (Figure 1, col. 4, line 54-55), wherein the trioelectric element 20 is lined with ceramic (i.e. a non permeable outer surface, Figure 1, col. 6, line 57-58).

Stencel does not teach the triboelectric element 20 of the charging section 12 being rotatable in the annular path 18. However, Bright et al disclose an electrostatic powder deposition having a tribo electrification device for charging particles (col. 1, line 5-7). The device includes a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) within a housing 40 (i.e. a chamber, Figure 1, col. 1, line 40-45 & col. 3, line 21-22), wherein rotor 34 may be coated with material such as nylon (i.e. a non permeable outer surface, col. 3, line 1-3). Bright indicates that the rotor fan 34 improves charging efficiency by providing a large surface area for

acquiring tribocharging during rotation (col. 2, line 43-49). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rotor fan of Bright in the device of Stencel in order to improve charging efficiency.

Stencel/Bright does not teach an electric filed in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency by increasing charge-to-mass ratios (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an electric field between two electrodes can effectively charge particles (Figure 5, paragraph [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an electric field of an ion generating source as suggested by Fotland in order to improve charging efficiency of Stencel/Bright.

32. Regarding claim 2, the fan rotor 34 of Bright has a member of blades (Figure 1, col. 1, line 41 & col. 2, line 47), resulting in a non-circular cross section.

33. Regarding claim 3, Stencel teaches an annular path 18 defined by a core member 22 and a cylindrical outer wall member 24 (Figure 1, col. 4, line 5-6).

34. Regarding claim 4, the inlet 28 and the outlet 30 of Stencel are positioned opposite each other (Figure 1).

35. Regarding claim 8, Bright teaches a typical speed for epoxy resin is about 3000 to 4000 rpm (col. 3, line 15-16), which is within the claimed range of rotating speed.

Moreover, the rotating speed is considered as an operating parameter of the device and manner operating the device does not differentiate apparatus claim (MPEP 2114).

36. Regarding claim 10, Fotland teaches that the electric field of corona discharge is created from a voltage source 9/11 by connecting a first lead to the first electrode 39 co-axially positioned within the housing 37 and a second lead to the second electrode 25 on the wall of the housing 37 (Figures 1 & 5, paragraphs [0015], [0022] & [0026]) and particles passing through the charging device are effectively charged (paragraph [0035]), but does not explicitly teach to connect the first lead to the rotor. However, since the rotor 34 is co-axially positioned within the housing 40 of Bright (Figure 1), one having ordinary skill in the art would immediately have envisioned to connect the first lead to the rotor in order to generate the electric field between the concentric rotor 34 and the housing 40 for improving charging efficiency of Stencel/Bright.

37. Regarding claim 11, Stencel teaches a separating section 14 downstream of the outlet 30 for separating charged particles (Figure 1, col. 4, line 55-56 & col. 5, line 12-17).

38. Regarding claim 34, the outer surface of the rotor 34 Of Bright has a continuous surface (Figure 1).

39. Regarding claim 35, the rotor 34 of Bright comprises a cylinder (Figure 1).

40. Regarding claim 36, the rotor 34 of Bright rotates in a horizontal axis (Figure 1).

41. Regarding claim 37, the rotor 34 of Bright includes blades for providing more surfaces for tribo-charging (col. 2, line 45-50). However, it has been held that omission of an element and its function is obvious if the function of the element is not desired

(see MPEP 2144). Therefore, omission of the blades from the rotor 34 of Bright is within ordinary skill in the art if a large surface is not desired.

42. Regarding claim 22, Stencel et al disclose an apparatus for triboelectric-centrifugal separation (ABSTRACT). The apparatus is used for separating charged particles from a raw feedstock including two species of particle (Figure 1; col. 4, line 35-37). The apparatus includes: a triboelectric charging section 12 having an annular path 18 (i.e. a chamber with walls, Figure 1, col. 4, line 1-3) with an inlet 28 (Figure 1, col. 4, line 35-38) and an outlet 30 (Figure 1, col. 4, line 54-55).

Stencel does not teach the triboelectric element 20 of the charging section 12 being rotatable in the annular path 18. However, Bright et al disclose an electrostatic powder deposition having a tribo electrification device for charging particles (col. 1, line 5-7). The device includes a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) within a housing 40 (i.e. a chamber, Figure 1, col. 1, line 40-45 & col. 3, line 21-22), wherein rotor 34 may be coated with material such as nylon (i.e. a non permeable outer surface, col. 3, line 1-3). Bright indicates that the rotor fan 34 improves charging efficiency by providing a large surface area for acquiring tribocharging during rotation (col. 2, line 43-49). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rotor fan of Bright in the device of Stencel in order to improve charging efficiency.

The claim contains means (rotatable means) plus function (for frictional charging the particles) language. The instant specification discloses this limitation as a rotor. The

charging fan rotor 34 of Bright is an equivalent structure. Therefore, the charging fan rotor 34 of Bright reads on the cited means plus function limitation.

Moreover, the instant specification discloses means for forming an electric field as an external voltage source for charging the particles.

Stencel/Bright does not teach an external voltage source in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency by increasing charge-to-mass ratios (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an external voltage source 9/11 can effectively charge particles (Figures 1 &5, paragraphs [0015], [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an external voltage source of an ion generating source as suggested by Fotland in order to improve charging efficiency of Stencel/Bright.

43. Regarding claim 23, the charging fan rotor 34 of Bright is positioned within the housing 40 Figure 1, col. 1, line 40-45 & col. 3, line 21-22) and rotor 34 may be coated with material such as nylon (col. 3, line 1-3).

44. Regarding claim 26, an electric motor 36 powers the fan rotor 34 (Figure 1, col. 2, line 39-40).

45. Regarding claim 28, Fotland teaches that the electric field of corona discharge is created from a voltage source 9/11 by connecting a first lead to the first electrode 39 co-axially positioned within the housing 37 and a second lead to the second electrode 25

on the wall of the housing 37 (Figures 1 & 5, paragraphs [0015], [0022] & [0026]) and particles passing through the charging device are effectively charged (paragraph [0035]), but Stencel/Bright does not explicitly teach to connect the first lead to the rotor. However, since the rotor 34 is co-axially positioned within the housing 40 of Bright (Figure 1), one having ordinary skill in the art would immediately have envisioned to connect the first lead to the rotor in order to generate the electric field between the concentric rotor 34 and the housing 40 for improving charging efficiency of Stencel/Bright.

46. Regarding claim 29, Stencel teaches a separating section 14 downstream of the outlet 30 for separating charged particles (Figure 1, col. 4, line 55-56 & col. 5, line 12-17).

47. Regarding claim 30, Stencel et al disclose an apparatus for triboelectric-centrifugal separation (ABSTRACT). The apparatus includes:

(1) a raw feedstock including two species of particle (Figure 1; col. 4, line 35-37);

(2) a triboelectric charging section 12 having an annular path 18 (i.e. a chamber with walls, Figure 1, col. 4, line 1-3) with an inlet 28 (Figure 1, col. 4, line 35-38) and an outlet 30 (Figure 1, col. 4, line 54-55); and

(3) a separating section 14 (i.e. a separator) downstream of the outlet 30 for separating charged particles (Figure 1, col. 4, line 55-56 & col. 5, line 12-17).

Stencel does not teach the triboelectric element 20 of the charging section 12 being rotatable in the annular path 18. However, Bright et al disclose an electrostatic powder deposition having a tribo electrification device for charging particles (col. 1, line

5-7). The device includes a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) within a housing 40 (i.e. a chamber, Figure 1, col. 1, line 40-45 & col. 3, line 21-22), wherein rotor 34 may be coated with material such as nylon (i.e. a non permeable outer surface, col. 3, line 1-3). Bright indicates that the rotor fan 34 improves charging efficiency by providing a large surface area for acquiring tribocharging during rotation (col. 2, line 43-49). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rotor fan of Bright in the device of Stencel in order to improve charging efficiency.

Stencel/Bright does not teach a first electric filed in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency by increasing charge-to-mass ratios (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an electric field between two electrodes can effectively charge particles (Figure 5, paragraph [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an electric field of an ion generating source as suggested by Fotland in order to improve charging efficiency of Stencel/Bright.

48. Regarding claim 32, Stencel teaches that a voltage source 16 (i.e. a second electric field) supplies power to the electrode 34 and wall 32 in the separation section 14 (Figure 1, col. 5, line 18-22).

49. Regarding claim 33, Stencel et al disclose an apparatus for triboelectric-centrifugal separation (ABSTRACT). The apparatus is used for separating charged particles from a raw feedstock including two species of particle (Figure 1; col. 4, line 35-37). The apparatus includes:

(1) a separating section 14 downstream of the outlet 30 for separating charged particles (Figure 1, col. 4, line 55-56 & col. 5, line 12-17); and

(2) a triboelectric charging section 12 having an annular path 18 (i.e. a chamber with walls, Figure 1, col. 4, line 1-3) with an inlet 28 (Figure 1, col. 4, line 35-38) and an outlet 30 (Figure 1, col. 4, line 54-55).

Stencel does not teach the triboelectric element 20 of the charging section 12 being rotatable in the annular path 18. However, Bright et al disclose an electrostatic powder deposition having a tribo electrification device for charging particles (col. 1, line 5-7). The device includes a charging fan rotor 34 (i.e. a tribocharging rotor, Figure 1, col. 1, line 40-45 & col. 2, line 309-40) within a housing 40 (i.e. a chamber, Figure 1, col. 1, line 40-45 & col. 3, line 21-22), wherein rotor 34 may be coated with material such as nylon (i.e. a non permeable outer surface, col. 3, line 1-3). Bright indicates that the rotor fan 34 improves charging efficiency by providing a large surface area for acquiring tribocharging during rotation (col. 2, line 43-49). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rotor fan of Bright in the device of Stencel in order to improve charging efficiency.

Stencel/Bright does not teach an electric filed in the chamber for enhancing the charging of particles. However, Fotland et al disclose an apparatus for electrostatic

deposition. Fotland states that particles are commonly charged by trio-charging means and the tribo-charging means may combine with other ion generating sources to improve charging efficiency by increasing charge-to-mass ratios (paragraphs [0020] & [0026]). Fotland further teaches that a corona discharge generator created from an electric field between two electrodes can effectively charge particles (Figure 5, paragraph [0022]). Therefore, it would be obvious for one having ordinary skill in the art to include an electric field of an ion generating source as suggested by Fotland in order to improve charging efficiency of Stencel/Bright.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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